DOCUMENT RESUME

ED 271 816 EA 018 581

AUTHOR Chance, Paul
TITLE Teaching Thinking.
INSTITUTION National Association of Secondary School Principals, Reston, Va.
PUB DATE May 86
NOTE 8p.
AVAILABLE FROM Publication Sales, National Association of Secondary School Principals, 1904 Association Drive, Reston, VA 22091 ($1.00 prepaid; quantity discounts).
PUB TYPE Information Analyses (070) -- Journal Articles (080)
JOURNAL CIT Curriculum Report; v15 n5 May 1986

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Cognitive Processes; *Critical Thinking; Curriculum Development; Elementary Secondary Education; *Instructional Systems; Philosophy; Program Descriptions; Program Implementation; Relevance (Education); Teaching Methods
IDENTIFIERS *Thinking Skills

ABSTRACT

As the world moves from the industrial age into the information age people become less dependent on basic facts and skills and more dependent on the ability to manipulate information. The higher level thinking skills that are needed in this new age must be taught in the schools. When selecting programs for teaching thinking, educators should assess each program's assumptions and goals, methods and materials, intended audience, requirements for training and teacher characteristics, potential benefits, and foreseeable problems. Among the pitfalls that those instituting programs should avoid are: moving too fast; trying to cover too much; expecting too many results too soon; neglecting evaluation, the home environment, and traditional course content; and capitulating to early failures. This report discusses the characteristics of six programs for teaching thinking and lists contact people at schools where the programs have been instituted. The six programs are CoRT (named for its originating institution, the Cognitive Research Trust), the Productive Thinking Program, Philosophy for Children, Odyssey, Instrumental Enrichment, and Thoughtful Teaching. Sources for additional information are cited. (PGD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Research / Concepts / Practice

nassp

Curriculum Report

Vol. 15 No. 5 May 1986 (ISSN 0547-4205)

Teaching Thinking

ED271816

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

T. Kowalski

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

EA 018 581

nassp
Research / Concepts / Practice
Curriculum Report
Vol. 15 No. 5 May 1986
(ISSN 0547-4205)

Teaching Thinking

Thinking—Is it the hottest topic in education today? Two recent national polls indicate that it is: A Gallup poll found that teachers ranked improvement in thinking at the top of the list of educational goals and a poll by the Association for Supervision and Curriculum Development found that 82 percent of its members wanted more information on how to teach thinking. Workshops, symposia, and inservice programs on the subject are cropping up everywhere. Why this sudden enthusiasm for teaching thinking?

The answer probably has to do with profound changes in society. Alvin Toffler, in *The Third Wave*, argues that we are leaving the industrial age and entering the information age. In the industrial age, most people worked in factories producing hard goods. In the information age, hard goods will be produced by machines. People will be employed in the manipulation of information.

These "knowledge workers" are now found in banking, insurance, government, communications, publishing, computer programming, medicine, social work, law, education, and research, but they are infiltrating every niche and corner of our society. In 1950, only 17 percent of those employed were knowledge workers; by 1982 the figure was 70 percent. We are becoming a nation in which things are made by things, and people work on ideas.

The rapidly growing interest in teaching thinking seems to reflect the growing realization that our industrial age curriculum is not meeting the needs of information age students. Studies have shown that, contrary to popular belief, our schools are doing a reasonably good job of teaching basic facts and skills, the knowledge and skills required for employment in an industrial society. But we are not teaching the higher level thinking skills that are basic to an information society.

For instance, the National Assessment of Educational Progress studies of reading show that most high school students can read a passage and answer straightforward comprehension questions of the "Who shot John?" type. But they have trouble with higher level questions, questions that require them to draw inferences from what they have read, identify the main point of the passage, rank the importance of ideas it contains, etc.

Studies of writing show that most secondary students have the mechanics of spelling, grammar, and punctuation pretty well mastered, but their writing lacks the higher level skills to propose good arguments in a persuasive essay or organize those ideas in a coherent manner.

EA 018 581

It's the same story in mathematics. Students have mastered the basics, but cannot solve problems that require something more than the mechanical application of a memorized algorithm.

The failure of students to learn higher level thinking skills is not new, but it has taken on new significance because of signs that these skills are becoming increasingly important to economic survival. The excitement about thinking instruction is not a passing fad, another education hula-hoop. Rather, it is a fundamental response to a fundamental change in our society. Educators everywhere are beginning to search for ways of including "thinking" in the curriculum.

In evaluating the various approaches, administrators and teachers should answer several questions:

1. What are the assumptions and goals of the program?
2. What methods and materials are involved?
3. For whom is the program intended?
4. What training or personal characteristics are required of teachers?
5. What benefits does the program produce?
6. What problems are likely to be encountered?

Programs for Teaching Thinking

CoRT Thinking Lessons

British physician and educational consultant Edward deBono believes that schools are particularly negligent when it comes to developing what he calls perceptual thinking. He argues that poor thinking often is due to errors in the perception of a problem, rather than in its analysis. The goal of CoRT (short for Cognitive Research Trust, deBono's organization) is to teach the student to use a number of "tools" which draw attention to the perceptual stage of thinking.

One tool, for example, is called PMI, short for Plus, Minus, and Interesting. In doing a PMI, the student lists the good things about an idea, the negatives, and things that are not easily characterized as either positive or negative but are nevertheless interesting. Another tool is called ADI. The student learns to examine the two sides of an argument by listing the points on which the two sides agree (A), the points on which they disagree(D), and the points that are irrelevant to the argument (I). A third tool is called Random Input. To generate new ideas, the student learns to bring in something unconnected with the subject. One way to do this would be to randomly put a finger on a newspaper, find

the nearest noun, and then see what ideas that word triggers.

These and other tools are taught in 60 lessons, one lesson per week for a period of two years. A typical lesson lasts between 30 and 50 minutes, and begins with the distribution of a four-page leaflet that describes the tool to be learned, gives examples of it, and provides practice items and other material. The teacher then leads the students in practice exercises and discussion of the tool under study. DeBono suggests time limits for each part of the lesson and encourages teachers to set a fast pace; the emphasis is on practicing, not discussing, the tools.

The CoRT program is said to be suitable for nearly all age and ability levels. DeBono indicates that the program has been used with elementary students and corporate executives, but most often with children at the upper elementary and middle school levels. Teacher training is considered unnecessary, but some workshops are available.

The program is said to make students more flexible, more likely to see other sides of an issue, more ways of solving a problem. However, research evidence for these claims is weak. One complaint about the program is the students already know what it attempts to teach. DeBono agrees that students know many of the tools, but says they do not use them. They know how to look for the pluses, minuses, and interesting points when considering an idea, but they do not do it. The program tries to make the use of tools such as PMI automatic.

CARL SANDBURG JUNIOR HIGH SCHOOL, 345 East Saint Charles, Elmhurst, Ill. 60126. *Contact*: Jean Cameron, principal. Telephone (312) 834-4534.

CoRT has been used at Carl Sandburg Junior High School for the past three years. At first, students studied CoRT I in the seventh grade, and CoRT II in the eighth. This year, teachers will cover less of the program in order to give students more practice at using the skills. At Sandburg, CoRT lessons are part of a thinking course that meets every day for nine weeks. The principal feels that it is important to teach the program in a separate course so that students may practice it independent of course content. However, once the skills are learned, considerable attention is given to encouraging the students to use the skills in their regular classes throughout the year.

Teachers have received no formal training in the use of CoRT, but this has not proved to be a problem. No formal evaluation has been conducted, but informal evidence suggests that the program is useful.

Principal Cameron says, "We think that the kids are using these skills in other classes."

There have been no negative reactions from parents, and while students were initially resistant—"We already know how to think!"—they soon came around. Adds Cameron, "It has sharpened all our teachers and has spread out in ways I wouldn't have predicted."

Productive Thinking Program

Psychologist Martin Covington of the University of California at Berkeley led a team of researchers that developed the Productive Thinking Program. The goal of the program is to improve productive thinking, a term roughly equivalent to creative problem solving.

The program assumes that productive thinking can be improved by teaching students to use various "thinking guides." One guide advises students to think carefully about a problem and decide exactly what the problem is before setting to work on solving it. Another guide tells students to evaluate possible solutions to a problem by checking each one against the available facts. A third suggests picking out the important items in the problem and thinking very carefully about each one.

The program material consists of 15 numbered booklets, each containing one "basic lesson," one "problem set," and one "class exercise." Each basic lesson tells a story in comic book style. The principal characters are Jim and Lila, two likable and believable youngsters 11 or 12 years old, and their Uncle John, a high school science teacher. In each lesson, Jim and Lila wrestle with a problem and model the thinking guides Uncle John teaches them.

In one lesson, for example, Jim and Lila try to figure out the identity of Mr. Search, a detective. The booklets encourage students to use the thinking guides by periodically asking questions. When Lila concludes on the basis of flimsy evidence that Mr. Search is the mayor, the students are asked to identify the thinking guide that Lila has forgotten. The students write their answers to such questions in a separate notebook and then compare them with those in the story.

Additional practice in the use of the thinking guides is provided by the problem sets. The four or five problems in each set are very different from the basic lessons. In one of these problems, the students are given certain clues and then asked to figure out how typhus is transmitted. The class exercise at the end of each booklet is a problem something like those found in puzzle books.

The entire program is usually covered in one semester, but teachers can stretch the lessons to last a year if they prefer. Generally, students work on the booklets in one class meeting and discuss their reading in the next, going over the problem, its solution, and the value of the thinking guides in reaching the answer.

The Productive Thinking Program is aimed primarily at fifth and sixth graders, and is deemed suitable for all but the slowest learners. The program is thought to be fairly easy to administer, so no teacher training is required. Careful reading of the teacher's guide before each class meeting is proposed.

The benefits of the program are said to include greater ability of students to generate original ideas, persistence at problem solving, and use of the guides in attacking problems. A fair amount of research provides support for these claims. Perhaps the most serious problem with the program is the vagueness of the guides. It is one thing to tell students not to jump to conclusions; it is another thing to *teach* them not to do so. The program assumes that practice and feedback can accomplish this end.

CHERRY VALLEY ELEMENTARY SCHOOL, 1001 Cherry St., Petaluma, Calif. 94952. *Contact*: Anna Womack, principal. Telephone (707) 778-4740.

Cherry Valley has used the Productive Thinking Program with fifth and sixth graders in their reading and social studies classes. The teachers met with trainers 13 times

during the two years of study to receive instruction in the program and to discuss their progress, problems encountered, etc. Teachers thought the program was effective and said that the students found it both enjoyable and challenging.

Criterion-referenced tests revealed that students in the program made greater gains in certain problem-solving skills than did control students. There were few problems. Parental reaction to the program was good, but not all teachers liked the rigidity of what are essentially programmed texts.

Philosophy for Children

Philosopher Matthew Lipman has developed materials to aid schools in doing a better job of critical thinking. He believes that the best way of doing this is by engaging students in serious discussion of important philosophical ideas, such as the nature of the mind, the meaning of truth, what is scientific about science, and what constitutes art.

Students meet three times a week for 40 minutes to read one of several novels, do exercises, and talk. The novels are at the heart of the program because their characters discover and model principles of reasoning in the process of exploring philosophical issues.

Harry Stottlemeier's Discovery, aimed primarily at fifth and sixth graders, is considered essential background for novels studied in later grades. Three novels are available for students in grades 7 through 12: *Lisa* raises questions about ethics; *Suki* deals with problems in language; and *Mark* focuses on social studies topics. In each of these novels, the characters use skills introduced in *Harry*.

The novels are essential to the program, but they are not the heart of it. The real value of the novels is in stimulating class discussions for students to use the skills modeled in the stories. The teachers must see that the students practice the skills as they explore issues raised by the books.

Various ways are suggested for accomplishing this. The teacher may, for example, impress upon students the importance of using terms with consistency by pointing out inconsistencies. The teacher may encourage students to look for underlying assumptions by pointing out that assumptions are being made. And the teacher can point out logical fallacies such as non sequiturs and ad hominem attacks.

These and other techniques are ways of keeping the discussion going while at the same time teaching students to appreciate the difference between rigorous and sloppy thinking. Lipman stipulates, however, that the teacher must *not* use these techniques to manipulate students toward what the teacher considers correct views. The discussions must take place in an atmosphere of free inquiry. The teacher's task is to teach the students *how* to think, not *what* to think.

Philosophy for Children now includes material for grades 3 through 12. Each novel is aimed at a particular grade level and is said to be suitable for a wide range of students. Indeed, any student who is capable of reading the novel for the grade level is thought to benefit from the program.

Teachers, however, must be carefully selected and trained. Teachers who think in terms of right and wrong answers, who are impatient to direct students to the "correct" conclusion, who do not have a genuine respect for student intelligence, who think that philosophizing is a waste of time, make poor candidates for the program. Even well-suited teachers are advised to undergo fairly extensive training. A two-week workshop taught by specially trained personnel is considered minimal training.

The program is said to improve reasoning, and teachers claim that students do become more thoughtful in their approach to problems, including schoolwork. The problems most likely to be encountered stem from the open-ended nature of the course. Some students dislike the lack of closure, and the lack of simple answers to complex questions. Since students are encouraged to discuss issues of importance to them, they may get into controversial topics such as abortion and school prayer.

Some educators are happier if students avoid such issues. Lipman responds that it is precisely by avoiding topics of interest to students that school becomes a dull and sterile environment; if students are to learn to think, they must have something worth thinking about.

BRUCE GUADALUPE SCHOOL, 825 North Van Buren, Milwaukee, Wis. 53202. *Contact*: Sister Jean Ellman, principal. Telephone (414) 271-2446.

The Philosophy for Children program has been used in Bruce Guadalupe School since 1977. Guadalupe is an independent school primarily serving Hispanic children in grades five through eight. The program is offered through the regular language arts period twice a week during the course of the school year. Teachers receive inservice training from a fellow teacher who has undergone the recommended training. Since most of the students are from Spanish-speaking homes, some teachers have used Spanish editions of the novels.

No real problems have arisen in using the program. Parents were consulted before implementation and warned that the students might discuss controversial topics. This may have precluded parental objections. Students, teachers, and the principal all reportedly like the program. Evidence is available of improved scores on standardized achievement tests in reading and mathematics, and teachers report that students are thinking more critically in their regular coursework.

Odyssey

In 1979, Venezuela set the goal of improving the thinking abilities of an entire generation of youngsters. To accomplish this end, various educational programs were developed and implemented. One of these programs has since been translated into English and published under the name Odyssey.

Odyssey was developed by a team consisting of members of the Venezuelan Ministry of Education, the Harvard University faculty, and the staff of Bolt, Beranek, and Newman, Inc., a Massachusetts think tank.

The development team assumed that, to teach thinking, one must teach not only thinking skills but the background knowledge necessary for applying those skills and certain attitudes favorable to their use. Although a wide variety of thinking skills are taught, the emphasis is on analytical reasoning.

The program consists of 99 45-minute lessons. Students have three or four lessons a week for a period of one or two years. The lessons are organized into six books, each devoted to a particular theme. The first and most important book is *Foundations of Reasoning*. As its name suggests, the theme of this book is reasoning.

Topics include observation and classification, ordering, analogies, and spatial reasoning. The remaining books build on these skills as they apply to language, problem solving, decision making, and creative problem solving.

Each lesson follows the same general format. The teacher begins with a general discussion of the topic. A lesson on change and sequence, for example, might begin with a discussion of how the students have changed over the years. After the introduction, the teacher leads the students in a series of exercises. Typically the teacher leads one or two demonstration problems and then asks the students to solve similar problems on their own. After each problem, the teacher conducts a discussion of the problem and its solution.

The teacher's manuals are quite explicit so additional teacher training is probably not required. (The publisher does offer training to schools that adopt the program.) The program is appropriate for the majority of students in grades four through six, and may be suitable for many students at higher grade levels.

IMPERIAL COUNTY DEPARTMENT OF EDUCATION, 1398 Sperber Rd., El Centro, Calif. 92243. *Contact*: George Parish, director of special education. Telephone (619) 339-6419.

Odyssey is a new program, and it is only now finding its way into American schools. Imperial County, Calif., obtained a preliminary version of the first book and offered it to certain schools of the district in the 1984-85 school year. A few teachers accepted the materials and are using them again this year.

No teacher training is available, but the teachers who elected to try the program got along well on their own. One teacher dropped the program after a brief trial because she found it too difficult to administer to her large (35-45 students) classes. Otherwise, both students and teachers are enthusiastic.

A district official commented, "The program has a lot of potential. It got the kids turned on."

Instrumental Enrichment

This program was developed by Reuven Feuerstein, an Israeli clinical psychologist. It is Feuerstein's belief that many slow-learning youngsters are more intelligent than their performance implies. These "retarded performers" suffer from a lack of "mediated learning experiences"; that is, experiences in which a knowledgeable person explains the thinking behind the activity. Instrumental Enrichment is a remedial program providing mediated learning experiences to improve the thinking of retarded performers.

The program consists of 15 units, each with a number of paper-and-pencil exercises designed to correct a particular deficiency in the student's thinking. In one unit, called Organization of Dots, the task is to connect dots so as to construct specified geometric forms. The main purpose of these kinds of exercises is to help students approach problems in a systematic, methodical way.

Other units deal with problems in spatial relationships, the analysis of complex forms, family relationships, numerical progressions, following instructions, and so on. Students have three to five lessons a week for a period of two to three years.

Typically, teachers begin each lesson with an introduction, and then guide students through a couple of demonstration problems. The students then work similar problems on their own. The teacher moves about the classroom giving assistance to individuals. When most students have finished the exercises, the teacher leads a discussion of the problems, the thinking skills involved, and relevance of these skills to other kinds of problems. The teacher ends the lesson with a summary of what has been learned.

Instrumental Enrichment has been used with a variety of students, from retarded to gifted, at both the elementary and secondary levels. The program was designed, however, as a remedial program for adolescents performing well below grade level. It is complex and somewhat difficult to administer effectively, so teachers must be capable and well motivated. They also must receive special training. (Materials are sold only to those who have completed an approved two-week workshop.)

Research studies on the effects of Instrumental Enrichment provide evidence that the program does improve the target thinking skills. Some evidence even shows that the benefits of training continue to increase after the training is discontinued. One problem with the program is that many of the exercises lack face validity; i.e., they do not appear to be designed to improve thinking. Feuerstein counters that it is necessary to avoid school-like activities since retarded performers have had frustrating experiences with such tasks.

GALLAUDET COLLEGE, Seventh and Florida Ave., NE, Washington, D.C. 20002. *Contact*: David Martin, department of education. Telephone (202) 651-5394.

The Department of Education at Gallaudet College, a school for the deaf in Washington, D.C., has utilized Instrumental Enrichment with college students and with deaf adolescents of varying abilities in the college's model school. The teachers at the school have used the program two to three times a week for a period of two years, completing 9 of the 15 units.

Evidence exists of improved logical reasoning on the Raven's Progressive Matrices, and reading comprehension and basic math skill improvement on the Stanford Achievement Tests. A special writing test showed more coherent, better organized compositions.

David Martin of the college's Department of Education is a certified Instrumental Enrichment instructor, and has trained the model school teachers himself. He believes that training is "absolutely essential"—a day or two of inservice before implementation, and three or four additional days during the school year. Martin reports that the students enjoy the program, though they may offer some resistance at first. He believes the program has been beneficial, but cautions against expecting immediate, dramatic improvement.

Thoughtful Teaching

In the foregoing programs and in others of their kind, instruction in thinking is set apart from the standard school curriculum. Thinking is treated as a separate subject comparable to, but independent of, regular courses. The alternative to this approach is to incorporate thinking instruction into the curriculum, to teach thinking in the process of teaching English, history, science, math, and every other subject.

This approach has been called "teaching for thinking" or "embedding," since thinking instruction is embedded into the curriculum. Embedding can take a variety of forms. The Thoughtful Teaching approach illustrates the concept of embedding.

The thinking skills taught in Thoughtful Teaching may vary from class to class. Several that are particularly useful at the secondary level include:

- Self-talk—talking to oneself while trying to recall information, solve a problem, etc.
- Imaging—imagining what is being described as one reads or listens to a lecture
- Paraphrasing—translating what one has read into one's own words
- Simplifying—solving a simpler version of a complex problem and then applying the solution method to the original problem
- Decomposing—breaking a complex problem into small parts and working on each in turn.

A variety of methods are available for teaching these and other thinking skills, but the Thoughtful Teaching approach relies primarily on modeling, prompting, and reinforcing. The teacher models the skill almost incidentally in the process of teaching the standard curriculum. He or she may model self-talk by thinking aloud to recall a person's name; paraphrasing by pausing while reading aloud to the class to put what has been read into his or her own words; and so on. Once the skill has been modeled, the next step is to prompt the students to use it.

The student who is unable to recall a person's name might be asked to use self-talk, to do much the same sort of thing he or she has observed the teacher doing. The teacher may prompt use of paraphrasing by interrupting a student who is reading aloud and asking the student to put the material into his or her own words. These efforts should, of course, be reinforced with praise, smiles, and the like.

The student who tackles a difficult math problem by working out a simpler version of it might be held up as a model for others to imitate. When students first are learning to use a skill, almost any effort should be reinforced. As they become more accomplished, the teacher should reinforce only the more successful efforts.

The model-prompt-reinforce method of teaching is appropriate to any age and grade level, and particular skills taught can be varied to meet student needs. Who should attempt to teach Thoughtful Teaching is less clear.

Obviously, the teachers must be competent at using the skills to be taught, and they must be able to incorporate these skills into their regular instruction. Training seems highly desirable, but workshops on the approach described here are not yet available. (Workshops are offered on other ways of embedding thinking instruction.)

Thoughtful Teaching is new, so data are not yet available on its effectiveness. Numerous studies exist in the research literature, however, documenting the value of its various thinking skills. Hundreds of studies have demonstrated the effectiveness of the model-prompt-reinforce method.

Embedding has its limitations: It is difficult to learn. Teaching thinking while teaching ordinary content requires a sophisticated grasp of both course content and thinking skills. This is not a program for mediocre teachers, nor for those who judge a program by the number of supporting materials.

CASCIA HALL HIGH SCHOOL, 2520 South Yorktown Ave., Tulsa, Okla. 74114. *Contact*: Richard Jacobs, Humanities Department Chair. Telephone (918) 742-7373.

Richard Jacobs has been working for the past three years with instructors in grades seven to nine to find ways of embedding thinking instruction in history, psychology, civics, and theology courses. The skills taught include evaluating sources of information, separating fact from opinion, distinguishing prejudice from reason, and identifying ad hominen arguments. Teacher training has taken the form of departmental meetings in which the skills and methods are discussed.

Not all the teachers, students, and parents have been enthusiastic about the program. Some parents have expressed concern that a shift from facts to thinking may lower scores on standardized achievement tests. Jacobs reports, however, that with no drop in achievement test scores, students seem to be approaching things more analytically.

Caveats for Principals and Teachers

Schools across the country are taking steps to teach thinking. Many have adopted one or more of the programs discussed here or others like them. Others are trying to create their own programs. These programs are a necessary response to changes in our society. But several pitfalls are present which all, especially administrators, should try to avoid.

1. *Moving too fast*. In the rush to get started, it is tempting to install a program without having studied it carefully. It is important to do the proper groundwork, to select the most appropriate programs, involve teachers, offer the necessary training, arrange ways of supporting teacher efforts, and so on.
2. *Attempting to do too much*. It is possible to make a list of 50 to 100 thinking skills for students to master, or to implement four or five different programs in a single school. The danger in such a scattered approach is that nothing will be done well, with costly and demoralizing consequences.
3. *Expecting too much*. Often we expect an educational innovation to raise SAT scores, end vandalism, motivate burned-out teachers, or correct just about any other problem in the schools. We should expect thinking in-

struction to improve student thinking. Other benefits are simply a bonus.

4. *Taking the short view*. No one is surprised that Olympic gymnasts, world-class chess players, or concert pianists have spent years perfecting their skills. The development of thinking also takes years of study and practice.
5. *Neglecting evaluation*. Evaluation is often thought of as something to be done later, but plans for evaluation should be made before a program is implemented. The evaluation should probably emphasize curriculum or criterion-referenced tests and standardized achievement tests. (See also item 3.)
6. *Neglecting the home environment*. The home environment has a powerful influence on the development of thinking, and programs that involve parents are almost certainly more fruitful than those that do not.
7. *Neglecting traditional course content*. It would be a mistake to emphasize the teaching of thinking to the neglect of necessary content.
8. *Capitulating to early failures*. If your first efforts are disappointing, modify the program and push on. Too many educational programs are scrapped permanently with the explanation, "We tried that; it didn't work." Mistakes are inevitable. We are only just beginning.

A new world is opening up, one that requires thoughtful, intelligent people. The movement to put thinking in our schools is basic if today's youngsters are to meet the challenges of that new world.

Additional Resource Materials

For a more detailed review of these and other thinking skills programs, see *Thinking in the Classroom* (Teachers College Press, 1986). This book provides greater detail and references for the program materials described above.

The Association for Supervision and Curriculum Development has formed a Thinking Skills Network. Write John Barell, 210 Chapin, Montclair State College, Upper Montclair, N.J. 07043. The network has published a *Directory of Resources* which lists people who have developed or are implementing thinking programs. The network also publishes a newsletter called *Cogitare*.

Another useful newsletter is *Teaching Thinking and Problem Solving*, published by Lawrence Erlbaum Associates, Inc., 365 Broadway, Hillsdale, N.J. 07642.

KUDOS

This *Curriculum Report* was prepared by Paul Chance, a former teacher and now a contributing editor at *Psychology Today* magazine.

Curriculum Report is a bi-monthly publication of the National Association of Secondary School Principals, 1904 Association Dr., Reston, Va. 22091. Telephone: (703) 860-0200. Annual subscription rate of $4 included in the dues of NASSP. Individual copies, $1; 2-10 copies, 85¢ each; 11-99 copies, 75¢ each; 100 or more, 60¢ each. *Payment must accompany orders of $10 or less.*

EUGENE R. HAWLEY, *President, NASSP*
SCOTT D. THOMSON, *Executive Director*
JAMES W. KEEFE, *Director of Research*

THOMAS F. KOERNER, *Director of Publications*
CAROL BRUCE, *Assistant Director of Publications*
WARREN C. SEYFERT, *Contributing Editor*
BARBARA PANNWITT, *Contributing Editor*